



**Newsletter from the Monroe County Department of Health**  
**Reviewed by the Brockport Consultation Group**

**Third Issue**

**Brockport Environmental News**

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Monroe County Health Department  
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**June 2001**

**Environmental Sampling**

***A Brief Overview of the Investigation Process***

Before samples are collected from a site, the operational history of the site must be reconstructed in order to identify what types of contamination might exist and their locations. This may be done by the regulatory agency responsible for overseeing the investigation and cleanup process (New York State Department of Environmental Conservation) or the potential responsible party.

This involves looking at historical information like maps and tax records for past ownership and land use, and reviewing past documents from the involved industry to find out what was made at the facility, what chemicals were used in production processes, where chemicals were stored on-site, and how waste chemicals were disposed of. Residents and past employees may offer information that helps regulatory officials learn details about the site that may not have been officially recorded. These are the initial pieces of the contamination puzzle.

After this preliminary information is gathered, an initial plan to collect samples from the site can be developed. Environmental sampling allows the involved regulatory agencies to confirm the accuracy of the historic information and document the presence of contaminants.

***The Purpose of Environmental Sampling***

Environmental sampling confirms where contamination exists and at what levels. Sampling is used to provide preliminary information about a site (exploratory sampling) and to provide information over a particular period of time or within a specific geographic area (monitoring). It is also used to verify that a site has been cleaned up (confirmatory sampling).

Sampling is usually conducted after it has been discovered or it is suspected that hazardous waste or chemicals have been spilled or released into the environment at a site. Sampling may also be part of a monitoring program required at facilities that use hazardous chemicals or produce hazardous waste as part of their operations.

The collection of small amounts of soil, surface water, groundwater, or air and the analysis at a certified laboratory will identify the presence or absence of site-related chemicals. This information can then be used to evaluate the existing environmental conditions of a site. Sampling reveals where contaminants are present (e.g. soil or groundwater), what concentrations are present

(e.g. parts per million), and where the general boundaries of the contamination are located.

### ***Developing an Environmental Sampling Plan***

As part of the investigation or monitoring of a site, a sampling plan that clearly identifies the strategies to collect useful information is developed.

During the sampling plan development stage, a site visit is conducted to gather information of site features such as topography (indicates potential drainage and groundwater issues), on-site structures (such as storage tanks), and infrastructure (pipelines and associated outfall points). Other factors considered when developing the sampling plan include the potential pathways that may allow contaminants to migrate from the site, and potential public and environmental exposure pathways. For more information on pathways of contaminant migration see **page 4**. All of this information helps determine the appropriate sampling approach, sampling locations, and laboratory analyses (tests) for the investigation.

According to the U.S. Environmental Protection Agency, sampling plans are commonly used to achieve the following objectives:

- Determine if there is a threat to public health or welfare of the environment
- Locate and identify potential sources of contamination
- Define the extent of contamination
- Determine treatment and disposal options
- Document the attainment of cleanup goals

### ***Approaches to Sampling***

There are different sampling strategies that can be used to confirm historical information and to obtain facts on the present environmental condition on a site. Sampling strategies include cluster, judgmental, random, stratified, and systematic sampling. These strategies may be applied to the entire site or to portions of a site. For example, the systematic sampling approach entails dividing an area into a series of squares or grid and then taking one sample from the center of each square.

In addition to the overall sampling approach, there are different techniques used to collect individual samples. Grab or discrete samples, composite samples, and split samples have been collected at locations on the 3M/Dynacolor site and the G.E./Black & Decker site, as well as off-site locations where it is suspected that contamination associated with these sites has migrated.

The following are definitions of sample collecting techniques:

**Grab or Discrete** – an individual sample collected from one location. The samples give you specific results showing the actual levels that contaminants are detected and at what locations. Many samples must be collected and analyzed to have a more complete understanding of the conditions at the site and depending on the size of the site, this can become expensive.

**Composite** – one sample composed of several individual samples. These samples are collected when average concentrations of contaminants are of interest and when funding or analytical capabilities are limited. Composite samples are generally less expensive because fewer samples must be analyzed than grab samples. However, the information provided is more general about the conditions at a site. Because several samples are mixed together, the results may show that a contaminant is present but specific information such as the location of the highest concentration detected is not well-defined.

**Split** – one sample that has been divided into two or more containers from a single sample container. Portioning assumes adequate mixing to assure the ‘split samples’ are, for all practical purposes, identical. This technique has been used by the NYSDEC throughout the investigation of the 3M/Dynacolor site and the G.E. Black & Decker site. The NYSDEC has split samples with the involved industries to compare and ensure the accuracy of the laboratory analytical results.

**Background** – sample collected from an area, water body, or site similar to the one being studied, but located in an area known or believed to be unaffected by the contaminants of concern.

### ***Laboratory Analysis for Contaminants***

There are specific laboratory tests conducted on samples to determine if suspected contaminants are present and if so, at what concentrations. It is important that the correct method of analysis is requested when the sample is delivered to a laboratory. The testing method conducted on the sample depends on the following:

the physical form of the sample (e.g. water, soil, sludge, sediment, oil, air vapor);

the purpose of the analytical method (e.g. a method developed for drinking water should be used on potable water and not on industrial wastewater); and

the specificity of the method (e.g. some methods can detect a broader range of chemical compounds while others pinpoint a few compounds.)

The following outlines the laboratory methods that have been conducted to detect contaminants associated with the 3M/Dynacolor site and the G.E. and Black & Decker site:

- PCBs - EPA Method 8082
- VOCs - EPA Method 8260
- SVOCs - EPA Method 8270
- Metals - EPA Method 7000 series
- Cyanide - (Total and Amenable) EPA Method 9012A  
(Free) EPA Method 4500-CN I

### What About Collecting Samples From My Property?

The New York State Department of Environmental Conservation, New York State Department of Health, and the Monroe County Health Department have received requests from residents to sample their properties. In many cases, agency staff members have met with residents and/or visited the property without taking samples because residents' properties are located outside the areas of concern.

Areas of concern are those areas identified as affected by contamination or within a potential contamination migration pathway. These areas of concern have been identified for the former 3M/Dynacolor and the former G.E. and Black & Decker site.

There have been property owners located outside the areas of concern that have contracted with environmental consultants to conduct sampling on their properties. If you choose to have sampling done on your property, here are some suggestions:

Hire an ELAP approved laboratory to *collect* samples according to the sampling protocol, *analyze* the samples and *interpret* the analytical results. This may save you additional fees that a consultant may charge to collect samples and interpret the results. **ELAP stands for Environmental Laboratory Approval Program.** The NYSDOH oversees this program.

Make sure that the correct analysis will be run on the samples from your property, e.g. if you want to know if PCBs are present in your yard's soil, the test should be EPA Method 8082.

The cost depends on the number of samples collected and the type of analysis.

Results usually take between six and eight weeks. There is an additional fee to receive results in a shorter time period.

If you have samples collected on your property and contaminants are detected, you are required by New York State Law to disclose the results of this analysis to potential buyers when selling your house.

Sampling results may show the presence of low levels of certain contaminants (e.g. SVOCs) that are associated with sources other than the hazardous waste sites. For example, road runoff and charcoal used for barbecuing contain chemicals that may be detected by laboratory analysis.



Sampling Containers

## Who to Contact for Site Information

### New York State Dept. of Environmental Conservation (NYSDEC)

- Linda Vera, Citizen Participation Specialist  
(716) 226-5324

### New York State Department of Health (NYSDOH)

- Mark Van Deusen, Outreach Coordinator  
1-800-458-1158 ext. 27530

### Monroe County Health Department (MCHD)

- Joe Albert, Senior Sanitarian  
(716) 274-6904

### Neighborhood Contacts

- |                 |                |
|-----------------|----------------|
| Kathy Snyder    | (716) 637-7391 |
| John Lessord    | (716) 637-5580 |
| Lynne Gardner   | (716) 637-4803 |
| Shawn Lessord   | (716) 637-4068 |
| Louise Cardillo | (716) 624-8392 |
| Ken Pike        | (716) 395-9080 |

## Pathways of Migration: The movement of contamination

### GENERAL DEFINITION

*Pathways of migration or fate and transport* are terms used to describe the movement and breakdown of chemicals in the environment. During a site investigation, one of the main objectives of environmental sampling is to determine how far contaminants have migrated from their source and to measure their concentrations at various distances from their source. This is done to determine the potential exposure to humans and the extent of the cleanup needed.

### METHODS OF MOVEMENT

The most common ways that contaminants are transported in the environment are wind, rain, surface water (e.g. Tributary #3), groundwater, and human intervention (stormwater pipes, wastewater pipes, drainage ditches, roads, railways, etc.). In addition to these transport mechanisms, there are physical and biological influences that affect the movement or migration of contaminants.

Physical influences include the topographical features such as valleys, mountains, slopes, rivers, lakes, and geological features such as aquifers, soil composition, and mineral composition. These influences can assist or obstruct chemical migration. For example, sandy soils are permeable (easily penetrated) and allow contaminants to move vertically and horizontally. Clay soils are less permeable and do not allow a contaminant to move freely. A combination of these types of soils may make tracking the movement of contaminants very difficult.

Biological influences include the biodegradation and bioaccumulation of chemicals. Biodegradation or the breaking down of chemicals can result in the formation of chemicals that are more toxic or less toxic than the original or parent chemical. This breakdown is caused by microbes (microscopic animals) found in soil and water.

Bioaccumulation is the condition in which a chemical is taken in by a plant or animal and does not dissipate (break up). Instead, it builds up in the plant or animal. It may metabolize (change) resulting in a chemical that may or may not be more toxic than the parent chemical. This build up of chemicals may be passed to animals through the food chain in two ways: 1) contaminated plants eaten by animals, and 2) contaminated animals eaten by animals.

The characteristics of chemicals also affect chemical migration. The following outlines the chemical characteristics that influence the movement and help to determine the extent of contamination:

**specific gravity** of a chemical - will it float or sink?

**solubility** of a chemical - will it dissolve in water?

- **viscosity** of a chemical – how easily a material flows in the environment?
- **volatility** of a chemical – how easily a material evaporates and generates vapors?

### A FEW EXAMPLES

Trichloroethylene (TCE) and cis-1,2-dichloroethylene, which is a breakdown chemical of TCE (ex. of *biodegradation*), have been detected in groundwater underneath a residential neighborhood north of the Erie Barge Canal. TCE originated at the former G.E. and Black & Decker site.

TCE:

- does not easily dissolve in water and remains there for a long time.
- quickly evaporates from surface water, so it may be found as a vapor in the air
- evaporates less easily from soil where it may stick to particles and remain for a long time
- does not build up significantly in plants and animals

Polychlorinated biphenyls (PCBs) have been detected in sediment collected from the stormwater sewer system along East Avenue and on-site at the former G.E. site, as well as in the sediment of Tributary #3. PCBs have also been detected in the surface soil in areas where Tributary #3 is prone to flooding.

The PCBs that entered the storm sewer system became attached to sediment particles, which were carried by water, and eventually discharged to Tributary #3 of Brockport Creek. The water in the tributary pushed the PCB-contaminated sediment northward and during rainstorms when the tributary flooded the sediment was deposited on the surface soil of residential properties.

PCBs:

- mostly stick to organic particles and sediments in water, but a small amount may remain dissolved
- build up in fish and marine mammals and can reach levels thousands of times higher than the levels in water (ex. of *bioaccumulation*)

## A Close Up Look At Cyanide

Cyanide is usually found joined with other chemicals to form compounds. Examples of cyanide compounds are hydrogen cyanide, sodium cyanide and potassium cyanide. Cyanide can be produced by certain bacteria, fungi, and algae, and it is found in a number of foods and plants. In the body, cyanide combines with a chemical to form Vitamin B12. Cyanide occurs naturally in cassava roots, which are potato-like tubers of cassava plants grown in tropical countries.

Hydrogen cyanide is a colorless gas with a faint, bitter, almond-like odor. Sodium cyanide and potassium cyanide are both white solids with a bitter, almond-like odor in damp air. Cyanide and hydrogen cyanide are used in electroplating metallurgy, production of chemicals, photographic development, making plastics, fumigating ships, and some mining processes.

### The 3M/Dynacolor Site and Cyanide

It is known that a form of cyanide called Prussian Blue (Ferric Ferrocyanide) was used at the 3M site for pigment in photo processing. Historical documents show that thiocyanates were present in wastewater at the facility at one time but no concentration levels were documented.

Laboratory tests, which were conducted to determine if cyanide was present at the site, were unable to identify different forms of cyanide and only indicated that cyanide in general was present.

Laboratory tests to identify specific forms of cyanide are not available at standard environmental laboratories. There are a few research laboratories that have the capability of conducting these tests. To date, no laboratory tests have been conducted to identify the specific forms of cyanide present.

-Monroe County Health Department

### **How Can You Be Exposed?**

People may be exposed to cyanide in the following ways:

- Breathing air, drinking water, touching soil, or eating foods containing cyanide
- Smoking cigarettes and breathing smoke-filled air during fires
- Breathing air near a hazardous waste site containing cyanide (see **Exposure Issues** box)
- Eating foods containing cyanide compounds, such as almonds, lima beans, and cassava roots
- Working in an industry where cyanide is used or produced, such as electroplating, metallurgy, metal cleaning, and photography

**Exposure Issues** - Cyanide was detected in soil samples collected in the Scout cabin yard and the residential properties bordering the northwest of the 3M/Dynacolor site. It was also detected in shallow groundwater well samples collected along Oxford Street and in the sediment of Tributary #3. It is not expected that people will be significantly exposed to cyanide from breathing the air in Brockport.

The grass cover in the affected areas provides a barrier limiting the exposure to cyanide in the soils. In addition, the Scout cabin area is now unused and the affected residential properties adjacent to the 3M/Dynacolor site have been purchased by the 3M Corp. and are vacant. Cyanide in the groundwater was detected at levels below the groundwater quality standard. In addition, no one is using groundwater for drinking purposes in the area. For these reasons, it is highly unlikely that current exposures to cyanide in the soils or groundwater will occur.

-Monroe County Health Department

### **Health Effects**

In large amounts, cyanide is very harmful to people. Exposure to *high* levels of cyanide in the air for a *short* time harms the brain and heart, and may cause coma and death.

Exposure to *lower* levels of cyanide for a *long* time may result in breathing difficulties, heart pains, vomiting, blood changes, headaches, and enlargement of the thyroid gland. People who eat *large* amounts of cyanide may have symptoms including deep breathing and shortness of breath, convulsions, and loss of consciousness, and may die. Use of cassava roots as a primary food source in tropical Africa has led to high blood cyanide levels.

People with high blood cyanide levels have also shown effects such as weakness of the fingers and toes, difficulty walking, dimness of vision, deafness, and decreased thyroid gland function. Chemicals other than cyanide may have contributed to these effects. Skin contact with cyanide can produce irritation and sores.

It is not known whether cyanide can directly cause birth defects in people. Birth defects were seen in rats that ate diets of cassava roots. Effects on the reproductive system were seen in rats and mice that drank water containing sodium cyanide.

**Potential Site-Related Health Effects** - The levels of cyanide detected from Prussian Blue, which was used at the 3M site for pigment in photo processing, would *not be expected to result in adverse health effects*.

-Monroe County Health Department

### Can Cyanide Cause Cancer?

The EPA has determined that cyanide is not classifiable as to its human carcinogenicity. There are no reports documenting that cyanide can cause cancer in people or animals.

### Determining If You Have Been Exposed

There are medical tests to measure blood and urine levels of cyanide; however, small amounts of cyanide are always detectable in blood and urine. Tissue levels of cyanide can be measured if cyanide poisoning is suspected, but cyanide is rapidly cleared from the body, so tests must be done soon after the exposure. An almond-like odor in the breath may alert a doctor that a person was exposed to cyanide.

(Health information courtesy of the Agency for Toxic Substances and Disease Registry)

### What Should You Do If You Think You Had An Exposure to Cyanide?

Tell your doctor. If you are generally healthy and experiencing no symptoms, the doctor will probably note your potential exposure in your medical record. If you are experiencing symptoms or health problems, your doctor may recommend some laboratory tests.

- Monroe County Health Department

### Information Sources More on Cyanide

#### Environmental Protection Agency

<http://www.epa.gov/ttnuatw1/hlthef/cyanide.html>

#### World Health Organization

[http://www.who.int/water\\_sanitatio...lth/GDWQ/Chemicals/cyanidefull.htm](http://www.who.int/water_sanitatio...lth/GDWQ/Chemicals/cyanidefull.htm)

#### Agency for Toxic Substances & Disease Registry (ATSDR)

<http://www.atsdr.cdc.gov/tfacts8.html>

### Children, Environmental Hazards, and Stress?

How can parents and children work together to cope?

(Article courtesy of Hazardous Substances & Public Health, Vol.10, No.1, Spring 2000)

When facing exposure or a possible exposure to hazardous substances in our environment, whether through hazardous materials in the water supply, airborne hazards, or mercury in fish, children and parents have to work together to reduce the associated stress. For children in this situation, states Dr. Pamela Tucker, Senior Medical Officer, Division of Health Education and Promotion, Agency for Toxic Substances and Disease Registry, "stress largely comes from two sources: parental stress and disruption of their daily routines." Their symptoms are as real as those of adults and can include the following:

- Sleep disturbances (e.g., resistance to bedtime, nightmares)  
Regressive behavior (e.g., acting younger than they are)
- Fears and anxiety (e.g., crying, dependent behavior)
- Problems in school (e.g., loss of interest, fighting)
- Increased complaints about illness (e.g., stomach aches)

When stress occurs, parents need to talk with their children and explain to them what is happening; providing them with simple, accurate information. Also, parents need to keep their children's routine as normal as possible. Other ways to manage stress include:

- Talking with children about their feelings;
- Establishing a familiar bedtime routine or leaving a nightlight turned on;
- Providing verbal reassurances, more frequent attention;
- Giving hugs or using touch as extra reassurance; and
- Talking with teachers and school counselors about the situation and any problems.

According to Dr. Tucker, ATSDR has provided information and community workshops on how to cope with the stress of living near a hazardous waste site, having to be relocated because of environmental hazards, or having been exposed to hazardous substances. "The key objective of these activities," she states, "is to provide needed education on how to prevent children from having health effects from stress."

## Glossary of Terms

**Analyte** – A chemical for which a sample, such as water, air, blood, urine or other substance, is tested. For example, if the analyte is mercury, the laboratory test will determine the amount of mercury in the sample.

**Biological Monitoring** – Measuring chemicals in biological materials (blood, urine, breath, etc.) to estimate chemical exposure in humans, animals or plants.

**Body Burden** – The total amount of a chemical in the body. Some chemicals build up in the body because they are stored in body organs like fat or bone or are eliminated very slowly.

**Leaching** – As water trickles through soils or landfills, chemicals in the soil may dissolve in the water. The water can then carry these chemicals through soil to pollute nearby groundwater or surface water.

**Metabolism** – All the chemical reactions that enable the body to work. For example, food is metabolized (chemically changed) to supply the body with energy. Chemicals can be metabolized and made either more or less harmful by the body.

## Community Corner

If you have a health related question regarding the 3M/Dynacolor or G.E. and Black & Decker sites that you would like the Monroe County Health Department to address in a future newsletter, please send it, call, or e-mail it to:

**Monroe County Health Department**  
111 Westfall Road, Room 976, PO Box 92832  
Rochester, NY 14692-8932  
Attn: Karen Paris Tuori

Karen's phone (716) 274-6397

(kptuori@mcls.rochester.lib.ny.us)

The Monroe County Health Department Staff will make every effort to respond in the next newsletter.



### What Do You Think About This Newsletter?

The Monroe County Health Department would like to know how to improve this newsletter. We would appreciate your input.

Please answer the following questions on the front and back of this page, cut on the dotted line, and return form to us in the return envelope provided. No additional postage is necessary.

Please circle or write in your answer.

1. Is the information in the newsletter easy to understand?

Yes

No

If No, please explain.

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**What's New**

**Former G.E. and Black & Decker Site**

G.E. and Black & Decker submitted work plans to the NYSDEC in May outlining the investigation to determine the source and extent of PCB contamination on and off-site. The information from this investigation will be used to prepare a plan for the removal of the PCB-contaminated sediment located in the on-site storm sewer system, and to address the PCBs in the storm water drainageway downstream from the site, including the storm sewer, Tributary #3, and adjacent surface soils. An open house hosted by the NYSDEC is scheduled for June 20, 2001 from 4 p.m. to 8 p.m. at the Seymour Public Library.

The construction on G.E.'s groundwater treatment system located on Lyman St. is almost complete and is expected to be fully operational in the near future.



**Groundwater Holding Tanks**

**Former 3M/Dynacolor Site**

The 3M Corp. is working with the NYSDEC and the Village of Brockport to develop a plan for the five vacant residential properties on Oxford Street. The 3M Corp. submitted a workplan to the NYSDEC in May for the investigation of soils and groundwater on properties west of Oxford St. The 3M Corp. also submitted a workplan to the NYSDEC to investigate the extent of cyanide contamination in Tributary #3.

**Signs Along Tributary #3**

At the request of residents, the New York State Department of Health (NYSDOH) developed and distributed signs to residents whose property borders Tributary #3 stating that contaminants have been found in the tributary. These laminated signs encourage people to stay out of the tributary and include a map of the area of concern, as well as the NYSDOH phone number to call for more information.



2. Is the newsletter too long?

Yes                      No

If Yes, how many pages would you recommend?

3. Is the format of the newsletter easy to read?

Yes                      No

If No, please explain. \_\_\_\_\_

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4. Please list which articles have been the *most* helpful to you.

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5. Please list topics you are interested in reading about in future newsletters.

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**Thanks for your input!**